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Overview of Research on Women in Medicine —Issues for Public Policymakers

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Synopsis

The recent expansion of the nation's supply of physicians has brought with it dramatic increases in the number of women entering medical school and practice. This paper provides an overview of the literature on women in medicine and synthesizes major findings on the differences between male and female physicians in terms of specialty choice, productivity, income, geographic location of practice, practice settings and types of patients, leadership within the profession, and other characteristics.

Between 1981 and the year 2000, the total supply of physicians in practice is expected to increase by 27 percent; the number of women in practice is expected to increase by 153 percent. By the year 2000, one physician in five will be a woman.

The fairly limited research on gender-related differences indicate that women tend to cluster in a few specialties (pediatrics, psychiatry, pathology, preventive medicine, physical medicine and rehabilitation, and anesthesiology,) many of which are specialties expected to have fewer physicians than needed nationally by 1990. Women have also been shown to have lower productivity and lower income than male physicians, to choose urban locations more frequently, to prefer salaried and institutional settings more often, to serve different types of patients, and to belong to medical organizations less frequently.

From the standpoint of public policy, the differences between the characteristics of male and female physicians have mixed implications. For example, the choice of specialty and lower productivity of women could lessen the negative impact of future physician surpluses. On the other hand, a preference for urban practice could exacerbate geographic maldistribution problems. More research will be required to define and predict the long-term effect of significant increases in the number of female physicians in the United States.

THE RECENT, SUBSTANTIAL EXPANSION of the nation's supply of physicians has brought with it a concurrent expansion in the number of women entering the medical profession. It is remarkable to consider, for instance, that between 1971 and 1982 the number of women enrolled in medical school tripled, while the number of men increased less than 14 percent (1).

The increased receptivity of the medical profession to women is clearly desirable from an egalitarian point of view. However, for policymakers concerned with assessing the adequacy of the supply of physicians and the programs that encourage practitioners to serve in areas of unmet need, this development is of importance if it changes the nature or level of medical services available in the United States.

Few studies on physician supply distinguish between male and female physicians. To some extent, this is because the number of female physicians has been very small, and the impact of gender-related differences, in terms of specialty choice, productivity, or other characteristics, was presumed to be small. Now that women comprise a larger and fast-growing percentage of physician supply, the question concerning differences is underscored. For this reason, a review of the research on female physicians may be useful.

We have attempted to review the literature on women in medicine and synthesize major findings, highlight questions that are unresolved or have not been addressed, and identify gaps in the research of special significance to policymakers in the public sector.

Women in Medical School

Overall, the number of women applying and accepted into allopathic medical schools has climbed dramatically in recent years. For the better part of the 20th century, through the early 1960s, women comprised about 5 percent of entering medical students (table 1). In the mid-1960s, an upturn began and, in the 1969-70 academic year, more than 9 percent of first year students in medical school were female; by 1985-86, more than 34 percent (5,800 students) were female.

The percentage of entering medical students who are female varies markedly from school to school. In 1983-84, the percentage of women (new entrants) in the first year classes of allopathic medical schools ranged from a low of 12.5 percent at Oral Roberts University to a high of 60.0

percent at the Medical College of Pennsylvania, a former women's college (2). In the 10 percent of schools with the lowest percentage of female students, women averaged 19.6 percent of first year enrollment; in the 10 percent of schools with the greatest percentage of female students, women averaged 47.8 percent of first year enrollment.

The number of women attending osteopathic schools also increased substantially in recent years, although the ratio of women to men has been and remains consistently lower than in allopathic schools. In the 1969-70 academic year, female osteopathic medical students comprised 2.4 percent (14 students) of first year enrollment; by 1982-83, women comprised 25.4 percent (428 students) of first year enrollment (3).

Most observers expect that the number of women in medical school will continue to increase, although the rate of increase has slowed in recent years. According to projections from the Bureau of Health Professions of the Public Health Service, the increased number of female graduates will expand the number of active women physicians from about 55,800 in 1981 to more than 141,000 by the year 2000, an increase of 153 percent (1). Since the total number of active physicians is expected to increase during this same period by only 27 percent, the proportion of female physicians will increase from 12 percent to 20 percent of all physicians.

Specialty Choice

A number of studies indicate that female physicians tend to cluster in specialties different from those of male physicians. In fact, in looking at the factors that influence specialty selection, the gender of the physicians is the one factor most readily correlated with choice of fields (4).

Over the years, women physicians have tended to choose anesthesiology and the five "P" specialties more frequently than men physicians—pediatrics, psychiatry, pathology, preventive medicine (public health), and physical medicine and rehabilitation. Women have also chosen certain specialties—essentially surgical fields—less frequently than men.

Differences in the specialty choices of men and women appear to be decreasing as the number of women in the medical field has increased (5). For instance, women now choose internal medicine most frequently as a first year residency (as do men), and they are choosing the surgical specialties

more frequently than in the past. Nevertheless, distinct patterns of specialty choice continue to be apparent, as can be seen in the 1984 residency data (table 2). The table indicates that female residents still choose training in the "P" specialties more frequently than do male residents and choose the surgical specialties less frequently.

The specialties that women have chosen tend to be those with lower prestige and lower income, and those that involve shorter periods of training. It is unclear whether these fields have attracted women physicians because they are more open to women, because women are less concerned with prestige or money, or because of the effect of subtle discrimination. It may also be that certain specialties carry less prestige partly because they have high numbers of women.

Impact of Specialty Choice Differences

In 1976, the Federal Government commissioned a group of national experts to advise the Secretary of the Department of Health and Human Resources on the number of physicians required in each specialty to bring the nation's physician supply and requirements into balance. The report, issued in 1980 by the Graduate Medical Education National Advisory Committee (GMENAC), projected a surplus of approximately 70,000 physicians over and above national requirements by 1990, with the excess number of physicians spread across most specialties (6). Although the estimated number of excess physicians was revised downward in 1983, when analysis of hospital-based specialty requirements was completed, the overall pattern of projected surpluses in most specialties did not change (7).

The 1980 GMENAC report did estimate that there would be a shortage or near balance of physicians in a few specialties and, for the most part, the specialty choice patterns of women tend to be among those specialties (table 2). Specialties favored by women that are expected to be in short supply in 1990 include psychiatry, preventive medicine, physical medicine and rehabilitation, and anesthesiology. Pediatrics, also favored by female physicians, is projected to be near balance.

By contrast, the specialty choice patterns of men have tended toward specialties projected by GMENAC as likely to have a surplus by 1990—the surgical fields and the subspecialties within internal medicine. Thus, to the extent that specialty choices of women continue past patterns, growing numbers of women physicians will help alleviate poten-

Table 1. Number and percent of women in first-year classes of U.S. allopathic medical schools, academic years 1929–30 to 1985–86, selected years

Academic year	Women in first year class	Percent women
1929–30.....	315	4.5
1939–40.....	296	5.0
1949–50.....	387	5.5
1959–60.....	494	6.0
1969–70.....	948	9.1
1971–72.....	1,693	13.7
1973–74.....	2,786	19.7
1975–76.....	3,647	23.8
1977–78.....	4,130	25.6
1979–80.....	4,713	27.8
1981–82.....	5,343	30.8
1983–84.....	5,775	33.0
1984–85.....	5,715	33.6
1985–86.....	5,800	34.2

SOURCES: References 36, 39, and 40 and unpublished data from the American Association of Medical Colleges.

tial mismatches in the nation's supply of and requirements for physicians. However, whether traditional specialty choice patterns of men and women will remain unchanged is uncertain; many expect the specialty choice patterns to converge, as the number of women physicians increases.

The potential beneficial impact of women physicians on the balance of specialists makes further research on male-female differences in specialty choice patterns a matter of considerable interest. However, for at least the next 20 years, the vast majority of physicians in practice will be those who are already in training or practice. Thus, even if the specialty choices of men and women begin to converge to a significant degree, there will continue to be major differences between the specialties of practicing women and men for some time to come.

Geographic Location

Physicians generally are not well distributed in relation to the population; however, male physicians are better distributed than female physicians, since women are more likely to locate their practice in physician-rich urban areas (8–11). The most likely reasons that prompt women to choose urban locations are the social advantages and the needs of dual-career families, since about three-fourths of women physicians are married to other professionals, usually physicians, whose job needs must also be accommodated (12,13).

Table 2. Number and percent of women residents on duty, September 1, 1984, by specialty

Specialty	Number	Percent
Allergy and immunology	67	25.9
Anesthesiology	750	19.2
Colon and rectal surgery	3	7.3
Dermatology	294	37.7
Dermatopathology	5	21.7
Emergency medicine	225	20.3
Family practice	1,789	24.1
Internal medicine	4,432	24.3
Neurological surgery	40	5.7
Neurology	343	24.3
Nuclear medicine	55	27.0
Obstetrics-gynecology	1,784	38.6
Ophthalmology	281	17.9
Orthopedic surgery	99	3.4
Otolaryngology	120	11.4
Pathology	858	34.8
Blood banking	11	32.3
Forensic pathology	10	28.5
Neuropathology	8	18.1
Pediatrics	2,859	47.4
Pediatric cardiology	30	21.7
Neonatal-perinatal medicine	82	37.9
Physical medicine and rehabilitation	214	30.0
Plastic surgery	57	13.2
Preventive medicine:		
General	60	33.1
Aerospace medicine	5	4.2
Occupational medicine	25	28.7
Public health	10	40.0
Combined general preventive/public health	18	31.0
Psychiatry	1,678	36.8
Child psychiatry	260	50.0
Radiology, diagnostic	686	21.5
Radiology, diagnostic (nuclear)	25	28.4
Radiology, therapeutic	125	24.0
Surgery	909	11.1
Pediatric surgery	6	22.2
Vascular surgery	0	0.0
Thoracic surgery	17	3.8
Urology	40	21.9
Transitional 1-year program	317	21.4
Total	18,603	24.9

SOURCE: Reference 41.

Current data indicate that the maldistribution of physicians relative to rural populations has decreased as the number of physicians has increased (14). However, there are no data on whether the preference of women physicians for urban locations is also changing over time. For public agencies concerned with the adequacy of physician supply in underserved areas, urban and rural, this possible change remains an important question requiring further research.

Practice Setting and Types of Patients

Women physicians choose to practice in salaried positions in institutionalized settings such as hospitals, medical schools, public health clinics, and in administration more frequently than men physicians do (8). According to figures of the American Medical Association (AMA) in 1981, 12.2 percent of all physicians were women but only 8.5 percent of the office-based physician population (8). In addition to being less frequently in office-based practice, they are less frequently working in incorporated practices (15). This choice has been a consistent difference over time, as it was documented in the early 1950s (16).

It is interesting to note that in recent years, during the same period that the number of women physicians has increased, physicians generally have begun to choose group practice and health maintenance organization settings more frequently than in the past. However, surveys of medical students (17,18) indicate that men and women students continue to expect to have different types of practice settings, with men more likely to expect to establish an independent or group practice and women more likely to expect a salaried position. Thus, differences in practice setting choices between men and women physicians appear likely to persist.

Physicians in salaried settings tend to work fewer hours and earn less money. The fact that women choose these practice settings more frequently and are an increasing proportion of the physician pool could reduce both the aggregate level of services available from physicians and the cost of services.

Women have a higher percentage of female and minority patients (19-22). The higher percentage of women patients has been attributed to the preference of some women for female physicians. The higher percentage of minority patients may result partly from the more frequent choice of women physicians for practices in urban, inner-city locations and salaried settings, many of which are public health clinics.

Members of minority groups often lack access to providers and health care services. They will benefit if the tendency of women physicians to serve minority populations continues. Because of the implications of the access of minority populations to needed services, further research on the practice location choices and the composition of patient loads served by female physicians could be useful.

Productivity

Women and men physicians clearly have different levels of work productivity (the amount of service produced per unit of time). Women physicians work fewer hours a week (15,22), are more likely not to be in active practice (8,13), see fewer patients per hour (15,21), are more likely to be in part-time practice (13,23), and are more likely to interrupt their training or career (24). Many people suspect that, because women live longer, their lifetime productivity is equal or greater than that of men. However, there is no evidence to support this notion. On the contrary, data from the AMA indicate that women are much less active than men in later years and work fewer years.

There is evidence that change in the relative productivity of male and female physicians is occurring. Although there are few historical studies on the productivity of female physicians, a comparison of the research of Dykman and Stalnaker (16) in 1953 with more recent studies (13,15,22) suggests that the differences in productivity between men and women physicians have decreased. One recent study (15) suggested that women physicians worked about 8 percent less time than men, not a great difference. Interestingly, most of the convergence in productivity appeared to be caused by male physicians' working less rather than by women physicians' working more.

Considering other findings on the same issue, Wunderman (8) reported that the percentage of women who were inactive (not practicing) had decreased from 12.3 percent in 1970 to 8.0 percent in 1978 (5.9 percent of male physicians were inactive in 1978). Another researcher (22) found that the increased ratio of productivity between 1973 and 1978 was due to the increased work hours of female physicians. Either of these findings could also account for some of the decreased differences in the productivity of men and that of women physicians.

One might assume that much of the lower productivity of female physicians is related to childbearing, yet the differences in the percentage of women versus men physicians who are inactive are more pronounced in the later years of practice (8). However, it is likely that some of the differences in the number of hours worked and also the training interruptions are related to childbearing and rearing. It is expected that there will continue to be some differences between the productivity of men and women physicians, as indicated by researchers who have found that

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women and men medical students project different productivity levels (18,25,26).

The implications of differences in productivity are several. Two of the most important are the return for all parties on the investment in medical training and the relationship of the supply of physicians to national requirements for medical services.

First, training for physicians is a costly enterprise for all concerned: for the student, who pays tuition and expenses, and for the Federal and State governments, which provide both direct and indirect support for medical training. Any lower productivity of female physicians would result in a lower return (fewer services provided) on the investment made in their training, although the magnitude of male to female differences is unclear. For instance, countervailing factors such as the lower income of women (discussed subsequently) may work to neutralize differences over the long term.

Second, as female physicians make up more of the physician population, the long-term effect of lower productivity is to increase the overall number of physicians required in the United States. In this sense, the excess of physicians projected by many may be mitigated by the increase in the number of female physicians. The GMENAC model, for instance, did not explicitly account for the lower productivity of an expanding supply of female physicians, although the issue was considered by the Delphi panel experts as part of their deliberations (6,27). How or whether these discussions affected the outcome of the Committee's final projections is unclear.

Income

The income of women physicians is significantly less than that of men, with estimates in the

literature ranging from about 58 percent (28) of that of male physicians to about 70 percent (22). If one takes into account the number of hours worked, specialty, and employment status (self-employed versus salaried), women still earn less than men, although the differences are less marked (22,29). For instance, the AMA estimated in 1982 that male physicians earned 36 percent more than female physicians on an annual basis, while the average net income on an hourly basis was 24 percent greater for male physicians (29). Among self-employed physicians, males earned 18 percent more.

Some of the differences in income have been attributed to differences in specialty choice and practice arrangements. In addition, several other reasons for these differences can be postulated: income ranks lower as a reason for women in selecting a specialty than it does for men (17); even as medical students, women expect to earn less income due to type of practice, shorter hours, and more time out of practice (18); income may be less important because women are frequently in two-earner families; or the difference may result from discrimination on the part of employers or patients (30-32).

Practice Styles

One of the more speculative areas concerning differences between women and men physicians has to do with practice styles. The hope is often expressed that women will be more caring and humanistic than men; however, there appears to be no data which either verify or refute this characterization. Bowman and Gehlbach (20) looked at the recognition of psychosocial problems by women and men physicians, an area in which one would expect women to excel if, indeed, they were more caring and humanistic. However, no difference was detected between the women and men physicians.

There is little other information on differences in practice style between men and women. However, information collected in the 1977 National Health Survey does provide data for a few comparisons (21). The survey indicated that male and female physicians did not differ significantly in proportions of patients referred to other physicians or admitted to hospitals, and both tended to dispense drugs at about the same rate.

Differences that were apparent in the survey data included an indication that female physicians were more likely to have new patients making

initial visits and less frequently had patients referred from other physicians. Further, female physicians practicing general, family, or internal medicine were more likely to see patients with diseases of the genitourinary system, while men were more likely to see patients with diseases of the circulatory system. These differences can be attributed to the different types of patients seen by male and female physicians.

Other studies (9-11) have indicated that women do spend more time with each patient, although the differences are slight (17.8 minutes for women versus 15.3 for male physicians). The possible impacts of longer visits on patients are unknown: more time could mean that women physicians are providing a higher quality of care or better communication with the patient, or both; or it could be an indicator of inefficiency.

Although generally one would expect that longer visits would be appreciated by patients, there have been insufficient studies to know whether patients are more or less satisfied with women physicians. One recent study of the effect of gender and training of residents on patient satisfaction found that both male and female patients evaluated care from female residents more favorably than care from male residents, especially on items related to the physician's manner and interpersonal style and the patient's feeling about the doctor (33). However, whether there were any real gender-related differences in physician behaviors or whether patients merely perceived and evaluated men and women physicians differently could not be ascertained.

There appears to be no research on whether the quality of care provided by women and men physicians differs. Thus, little is known on how or whether the expanding supply of women physicians will change the day-to-day practice of medicine or affect the health outcomes for the individual patient.

Leadership Positions

Women physicians belong to fewer medical organizations and associations (34) and tend not to be in positions of power in medical institutions or associations. In a recent AMA survey, the major reasons cited by women for not joining professional organizations were lack of time and competing obligations (for example, family), lack of opportunity, and lack of interest (34).

In recent years, the percentage of all physicians who belong to the AMA has decreased, diminish-

ing its power to speak with a unified voice for the profession. The association's ability to do so may well be further eroded by increasing numbers of women physicians, if women continue to be relatively uninvolved. The desire of the AMA and other professional organizations to increase the membership of female physicians has led several (including the AMA, American Academy of Family Physicians, and American Psychiatric Association) to develop special task forces related to women physicians. These and similar efforts to recognize and accommodate women physicians may reduce fragmentation within the profession and help retain the power and coherence of organizations representing physicians' interests.

Foreign Physicians—A Confounding Factor

Foreign medical graduates (FMGs) contribute significantly to the supply of physicians in the United States. In 1970, there were approximately 57,000 FMGs in the United States, some 17 percent of the total physician supply (1). By 1981, 21.2 percent (99,000 MDs) of all practitioners were graduates of non-U.S. medical schools (35).

A large proportion of women physicians in the United States are FMGs, reflecting the fact that medicine is a more common profession for women to enter in many countries. In 1981 some 32.0 percent (22,200 MDs) of all active female physicians in the United States were foreign graduates, as compared with 20.0 percent (89,800 MDs) of all active male physicians (36).

Although there are significant differences between U.S. and FMGs in terms of specialty choice and practice settings, it is unclear whether these are accounted for by differences between U.S. and foreign graduates or whether differences are related to the greater percentage of women among FMGs. Foreign medical graduates are less frequently in the surgical specialties and general practice and more frequently in pediatrics and the hospital-based specialties, many of the specialties in which women tend to cluster (37). Further, foreign medical graduates practice in institutionalized settings even more frequently than do female U.S. graduates, and are less apt than U.S. physicians to enter private practice (37).

From the standpoint of public policy issues, the gender mix of FMGs and its possible effect on subsequent specialty training and practice setting will continue to be of interest as long as significant numbers of foreign medical graduates seek to practice in the United States. However, past

research may not provide an adequate perspective on the issues involved because of major changes in the FMG group. Most new FMGs are U.S. citizens who have trained abroad, rather than foreign-born physicians; and, in 1979, almost 95 percent of U.S. FMGs were male (38).

Future Research and Public Policy

Many of the differences between men and women physicians that we have outlined have public policy implications. Women are known to have lower productivity, lower income, different specialty choices, different practice locations, different types of patients, and to belong less frequently to medical organizations. The differences between men and women physicians have persisted over time and seem likely to continue for the foreseeable future, although the differences in productivity and specialty choices appear to have decreased slightly in recent years.

The implications of the differences between men and women physicians in the face of increasing numbers and percentages of women physicians are several. On the positive side, the potential effects of an oversupply of physicians could be partially alleviated; the maldistribution of physicians with certain specialties could be improved; and the cost of medical care could be reduced, due to lower per physician income. On the other hand, the geographic maldistribution of physicians might be exacerbated to the detriment of rural areas, in particular. Other potential effects could be a diminution of the cohesiveness and organizational unity of the medical establishment, leading to less effective public debate of medical issues but, perhaps, also to a debate argued in a wider range of voices.

More and better research in virtually all these areas is needed. Studies that would help to clarify the changes occurring in the productivity and specialty choice of women physicians are a particular priority from a public policy standpoint, since the patterns of women in these areas could substantially alter our view of whether a given supply of physicians represents a surplus.

Research into the other possible differences between male and female physicians, including differences in practice settings, types of patients, income levels, and participation in the medical organizations is also of interest to policymakers concerned with the long-term development of health care services. At present, very little is known about the practices of women physicians—

whether they differ in significant ways from those of men and the effects of any differences on the patient or on the cost and availability of medical care. In sum, the rapidly expanding supply of women physicians is a significant new development in medical care in the United States, requiring substantially more research to define and predict the long-term effect.

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The Cognitive Profile of Those Who Intend to Exercise but Do Not

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Synopsis

The purpose of this study was to identify the cognitive profile of people who intend to exercise but fail to carry out this intention. A theoretical framework was adopted to study the attitudinal beliefs of these persons about exercise, their evaluation of the associated consequences, and their normative beliefs and motivation to comply with these norms.

Subjects were classified according to the congruence between stated intention and self-reported exercise behavior 2 months later in this way:

positive intention and congruent behavior (CONG +, N = 74).

positive intention and incongruent behavior (INCONG -, N = 45).

negative intention and congruent behavior (CONG -, N = 42).

negative intention and incongruent behavior (N = 2, not analyzed).

MANOVA analysis indicated little difference between the cognitive profiles of inactive and active positive intenders. Relative to the CONG + group, the INCONG - group perceived that regular exercise would be "tiring" ($P < 0.001$) and "time consuming" ($P < 0.001$); they also placed less value on the consequence of "being healthy" ($P < 0.05$). Both groups differed from the CONG - group. As would be expected, those with positive intentions to exercise identified more advantages to being physically active.

It appears that sedentary positive intenders perceived the exercise behavior as physically demanding and had difficulty in reconciling the time demands of an exercise program with their weekly schedules. This observation suggests that these two beliefs should be considered for the promotion of physical activity as well as the investigation of influential social and environmental variables.